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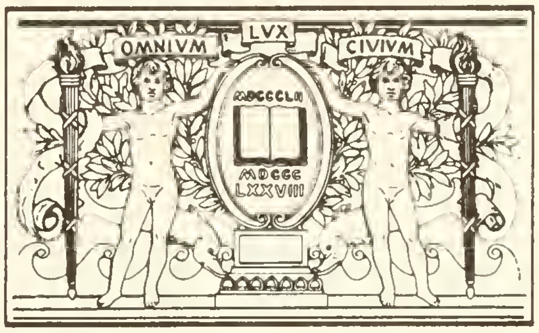

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MEMORANDUM

TO: Mayor Raymond L. Flynn

FROM: Economic Development Working Group

RE: First Steps to Recovery for Boston and the Bay State, 1990-1992: The Key Projects Pipeline

DATE: May 16, 1990 (revised)

Executive Summary

Economic activity in Boston, the Bay State, and New England as a whole, has slowed considerably since the rapid growth years of 1982 to 1988. We remain convinced that the fundamental strengths of the region's economy will prevent New England from becoming the Southwest of the 1990s, but are concerned that the recovery projected by local economists, including the New England Economic Project, for 1991 could be further delayed at enormous economic and human cost.

Even with the current slowdown, the underlying strengths of the Boston and regional economies remain. In particular, the health care industry's prospects are bright, with Boston's specialized research institutions anticipating strong growth in the next decade. Nonetheless, the credit crunch and the state's continuing fiscal crisis threaten the region's potential for future growth. The credit crunch is already depriving small businesses of the capital they need to expand. The state's fiscal difficulties are threatening its ability to maintain and improve the infrastructure on which the economy depends.

The people most severely affected by current economic conditions are the men and women of the construction trades. According to DRI/McGraw Hill, the volume of commercial and industrial construction in Massachusetts fell 34 percent last year and will drop another 5 percent this year. Since 1987, construction employment in Massachusetts has declined by 34,000 jobs. In the Boston metropolitan area, where the majority of the state's construction workforce is located, union leaders estimate trade unemployment at a staggering 30 percent. The number of unemployed construction workers statewide has swelled to at least 38,000 -- the number seeking unemployment insurance at the end of March, according to the Massachusetts Department of Employment and Training. The construction sector is experiencing depression conditions and the human impact in terms of drastically reduced standards of living and threatened homes is of critical concern.

This memorandum proposes a strategy for first steps toward economic recovery. The core concept we are proposing is using the construction industry to lead the recovery of the economy as a whole. The means for accomplishing this is the acceleration of the construction of the "key projects pipeline" -- $5.3 billion of federal, state, and local capital projects and private development projects. This counter-cyclical infusion of new capital will put thousands of people back to work in the construction trades, give rise to increased demand for related services in the fields of architecture, engineering, law, environmental planning, and finance, and generate substantial additional economic activity, as measured by the multiplier effect, for the regional economy.

The direct and derived effects of the key projects pipeline can yield approximately 26,800 jobs in all sectors of the economy, of which 10,400 will be in construction firms and trades, 7,300 will be in design, engineering, and related firms receiving direct project funding, and 9,000 will be supported through derived economic activity throughout the state economy, as firms and individuals provide goods and services to development workers and companies and to the workers and companies that they do business with. Most importantly, the strategy will help lay the foundation for an economic recovery that will put the construction industry and related businesses back to work.

The key projects pipeline is a five-part public and private investment program for 1990-1992, embracing:

- The megaprojects, with projected expenditures from now through 1992 totaling $1.7 billion;
- A $392 million city capital improvement program, through 1992;
- State capital improvement projects worth $1.7 billion during this period;
- Eight key commercial development projects, underway, approved, or planned, with total project expenditures exceeding $1.0 billion in the next thirty months; and
- New economy, institutional, health services, medical research and new technology related development, with total project expenditures exceeding $519 million through 1992.

The analysis of the key projects pipeline presented in this memorandum was one of three scenarios examined by the working group, and was based on the intermediate assumptions that 75 percent of planned commercial, institutional, and Massachusetts public agency projects not already underway will actually be commenced within the 1990 to 1992 time frame. The results of this

analysis are presented in the attached table identified as "Scenario 1."

An alternative scenario examined by the working group assumed that only 75 percent of all planned projects in the key projects pipeline -- both public and private -- not already underway, will actually be commenced during the 1990-1992 time frame and that no state agency projects will commence in the remainder of 1990 because of budget difficulties. Even with these assumptions, this scenario generated more than $4.8 billion in total capital expenditures in the next thirty months, as presented in the attached table identified as "Scenario 2."

A third scenario examined by the working group assumed that all projects included in the key projects pipeline would commence on schedule, generating total capital expenditures through 1992 of $6.3 billion, as presented in the attached table identified as "Scenario 3."

The conclusion of working group is that assuring that the construction of the key project pipeline moves forward on or ahead of schedule during the next thirty months can effectively reverse the economic slowdown suffered in Massachusetts over the last year and a half and provide a basis for new economic expansion in the 1990s and beyond.

Our previous memorandum outlined the threats to economic recovery posed by the continuing state fiscal crisis and the credit crunch afflicting local businesses seeking loans for development projects and capital improvements. Since the date of that memorandum, positive developments have occurred with respect to both concerns. The state House of Representatives has acted to approve a $1.2 billion tax package, signaling a new willingness by the state leadership to address the fiscal crisis with positive action. Still, formidable public opposition to new taxes remains.

And, on May 11, banking leaders, including the directors of the American Bankers Association, Comptroller of the Currency Robert Clarke, Federal Reserve Board Chairman Alan Greenspan, and Federal Deposit Insurance Corporation President William Seidman met privately. Bankers were urged by the top regulators to continue lending to credit-worthy customers. Moreover, Clarke, apparently responding to concerns over the impact of the credit crunch on the New England economy, said that bank regulators had now uncovered the worst of the problems at New England banks, had acted to solve them, and were turning their focus to other parts of the country, including the Mid-Atlantic states.

These developments indicate that two of the most serious obstacles to new capital investment in Massachusetts have begun to be addressed. Removal of these obstacles is essential because new capital investment in the next thirty months is the key to

achieving a near-term economic recovery and to laying the foundations, in the form of new infrastructure and facilities, for the next generation of regional economic development and innovation.

Just as it is important to develop the physical resources of the region, we must not lose sight of the fact that human capital is the region's most important resource for economic expansion and innovation. The skill enhancement provided by vocational education is critical to ensuring that the next generation of growth in the economy provides real economic opportunity to the greatest number of our citizens.

A framework economic recovery plan for the 1990s will be the subject of the third report in this series. This report will address, among other things, the role of public and vocational education, the opportunities presented by the emerging European economic community, the need for new markets and sources for capital investment, ways to improve marketing of the Boston and the region, a review of strategies adopted by other states, the implications of the saving and loan bailout for the regional economy, and the prospects for the biomedical, research, and health services economy.

I. The Counter-Cyclical Economic Impacts of the Key Projects Pipeline

The total economic impact of the construction of the $5.3 billion pipeline of public infrastructure and commercial and institutional development projects is dramatic. If achieved, they will:

- Produce more than 25,000 worker-years in new construction employment through 1992, enough to employ over 10,000 construction workers continuously over the two-and-a-half year period;
- Add over $900 million in construction payroll during this period for those who have been hardest hit by the economic slow down;
- Realize an annual average of nearly $20 million of direct income tax revenue to the state;
- Catalyze an economic chain reaction resulting in the addition of more than 26,000 jobs to the regional economy;
- Provide an additional $25 million in annual state tax revenues through derived economic activity.

New construction expenditures will have "derived" benefits throughout the economy, because money brought into the economy through construction salaries and related project expenditures are then spent and respent, generating additional employment and economic activity. The magnitude of this "multiplier effect" is computed in this analysis through coefficients developed for the Massachusetts economy by the Regional Industrial Multiplier System of the U.S. Department of Commerce, Bureau of Economic Analysis. Construction jobs are important as well in broadening access to the economy. They offer a high-paying alternative to the service sector, spreading the economic benefits of the increasingly service-based economy.

In addition to bringing immediate relief to the regional economy in the form of new jobs, wages, and tax revenues, construction of the key projects pipeline will build a multi-billion-dollar new foundation for a more diverse and productive economy for Boston and the region. Public infrastructure projects, such as the Central Artery and Third Harbor Tunnel, will increase the accessibility and convenience of Boston, the principal center of economic activity in Massachusetts. Commercial office development projects will allow for continued expansion of the service and business sectors, while institutional expansion will promote the continued development of the medical research and biotechnology components of the "new economy" and the continued development of the region's world-class universities and health care institutions.

The key projects pipeline strategy will be effective in providing counter-cyclical mitigation for the immediate economic and human impacts of the current slow down and in speeding economic recovery, because it will bring into the present regional economy money from outside that economy and from the future -- it is not a strategy for "zero-sum" trade-offs among alternative uses for limited tax revenues and private funds already circulating within the economy. The key projects pipeline will be funded through investment capital from world financial markets, including the public bond markets, and from federal highway and other grants. Because the "opportunity costs" of these investments do not have to be paid currently, at a time of economic difficulty -- or ever, in the case of federal grants -- the key projects pipeline offers an effective, strategy for "flattening" the business cycle.

Moreover, expediting the key projects pipeline makes economic sense simply in terms of money saved. Because of market conditions, average bids on construction contracts, as reported by the Executive Office of Community Development, have fallen from as much as 15 percent above the anticipated cost in 1988 to as low as 20 percent below the anticipated cost and competition for work is now intense. The MWRA reports that the $86 million of contracts awarded by the agency in the past 10 months were estimated by the agencies engineers to cost $112 million -- 23 percent higher.

Thus, undertaking projects now, with idle construction capacity available, not only helps a distressed industry, but also allows construction cost savings to be realized.

II. Public and Private Investment: Strategies for Balanced Growth

Boston's recent history demonstrates how public infrastructure and private development projects can catalyze economic growth. From 1960 to 1975, $2.5 billion of public infrastructure investment compensated for negligible public outlays in the years from 1930 to 1960 and, added to new tax incentive measures and the growing demand for Boston's broad range of services, generated, in the early 1960s, the first wave of commercial development since the 1920s.

Private development investment emerged as the engine of growth in the 1980s, encouraged by the thriving city and state economies which experienced record expansions in employment and income. More than $8 billion of private capital was invested, from 1975 to 1990, to meet the needs of the expanding service-based economy. Without the prior public investment in infrastructure, this $8 billion investment in Boston would not have occurred, and the growth of the professional service economy -- the heart of Boston's economic success -- would not have been launched.

Public infrastructure construction and private development investment can again join together to bring economic recovery to Boston and the Bay State in 1991 and 1992, and, in turn, broaden the base for future economic prosperity. In the key projects pipeline, public capital investment would dominate, making up 73 percent of the $5.1 billion total public and private pipeline. Capital outlays of cities and towns, other than Boston, have not been included in the total, because information is unavailable at this time. Their impacts on the Massachusetts economy, if coordinated within this timeframe, could be significant.

Private development investment in the next thirty months could total $1.8 billion, of which more than half ($1.0 billion) would center in 8 major commercial development projects, and one-third ($520 million) would comprise higher education and medical institutional projects. This development investment represents something over half the total investment to be made in connection with these projects. The remainder would be invested after 1992.

The success of the key projects pipeline strategy assumes that inappropriate constraints on capital investment are removed and the public and private sectors work to expedite construction starts. It also assumes there will be a substantial economic return on both the public infrastructure investment and the expansion of commercial and research economies. The positive near-term economic effects of the key projects pipeline are substantial, but benefits

are not limited to the 1990-1992 period. In fact, the effects increase after 1992 since more than 85 percent of expenditures on the megaprojects occurs after this period.

III. The Megaprojects

The megaprojects -- the Central Artery Depression, Seaport Access Road and Third Harbor Tunnel, and Harbor Clean-up-- represent a total investment in infrastructure of over $10 billion dollars over ten years. Particularly significant in the near term is the substantial federal contribution to these projects. For the purposes of this analysis, some $1.7 billion of expenditures are assumed in the critical 1990-1992 window, employing more than 1900 construction workers over the next thirty months.

The real significance of the megaprojects, beyond the enormous economic boost they provide, is the fundamental improvement to the region's transportation system and environmental quality that will result from them. Yet, like all major public or private undertakings, the process of reviewing the impacts of the megaprojects has taken on a life and purpose of its own. Delays abound. While environmental issues such as air quality impact must be definitively reviewed and addressed, other, lesser included issues have assumed significance beyond reasonable or balanced proportion in the current atmosphere of review. Now is the time for public and private leadership to regroup in support of these vital projects.

Central Artery and Third Harbor Tunnel

The Central Artery was designed in the 1950s for 75,000 vehicle trips per day, but by the mid-1980s it was carrying 180,000 vehicle trips daily. The Artery was intended to be one of a network of roads that would facilitate the regional flow of traffic through and around downtown Boston. The other components of this regional road network were never built, however.

To improve conditions for those heading for downtown, and those passing through, a two-part project is underway: a subsurface replacement artery with expanded capacity will be built and a four-lane tunnel will be laid under Boston Harbor. Without these improvements to the already overloaded regional transportation system, further significant expansion in Boston's economy is imperiled.

Together, the Central Artery and Third Harbor Tunnel will cost an estimated $4.4 billion. Direct construction employment on-site will average 2,600 jobs per year over the next 8 years, with a peak of 4,500 jobs in 1994. Over the four-year period from 1993 to 1996, construction will average 3,700 jobs per year, roughly equal to the number of construction workers needed to build four million

square feet of office space in each of these four years.

Harbor Clean-Up

The Harbor Clean-Up project consists of the construction of one of the world's largest sewage treatment plants at Deer Island and the separation of the combined sewer overflow system. The Massachusetts Water Resources Authority has been directed to create the infrastructure necessary to stop the stream of sewage into Boston Harbor, so that eventually the Harbor can resuscitate itself. The project will cost $6.1 billion, with completion expected in 1999. Construction employment will range up to a peak of 2,250 jobs in 1993, with 930 jobs in 1991 and 1,830 jobs in 1992.

Over the next 12 months, the MWRA expects to advertise and award 26 construction contracts worth $720 million. The MWRA is calling 1990 "the year of construction".

The significant projects to be bid in 1990 include:

- The primary wastewater treatment plant, with construction to begin in December and a total development cost of $570 million;
- The five-mile cross-harbor tunnel and the nine-and-one-half-mile effluent outfall tunnel, with construction to begin in the fall and a total combined development cost of $576 million;
- The installation of all essential construction support for the new plant, including road, water, power, and fuel infrastructure, and a multimillion dollar, concrete batch plant.

The need to expedite the megaprojects is clear. The continuing delays in project commencement not only postpone the beneficial effects of a major infusion of federal money into the state at a time when this infusion is most needed, but extends the time during which the megaprojects remain politically vulnerable.

More significantly, critical improvements to the region's quality of life are delayed as well. A Boston with a clean harbor, better air quality, improved traffic flow, and a ribbon of new downtown parks, mirroring the vision of Olmsted's generation, will be a better place to work, study, live, visit, and enjoy.

IV. State Capital Projects

The critical components of the state's capital program are a wide array of bridge and road repair projects and institutional and

community development projects. Planned capital investment by Commonwealth of Massachusetts budget agencies (not including the megaprojects) is assumed to be $925 million per annum for 1991 and 1992.

Important to the state's ability to proceed with the major portion of its capital program relating to road and bridge improvements and repairs is favorable action on the proposed increase in the state's gasoline tax, now under consideration before the legislature. A ten cent increase in the gasoline tax would provide approximately $275 million in new revenue per year earmarked for capital improvement projects.

The agencies funded under the Commonwealth of Massachusetts budget are presently constrained by a capital spending ceiling set at $925 million. This cap has been imposed by the Wall Street investment analysts who set the Commonwealth's bond rating. For the fiscal year 1991 budget, the Commonwealth's Budget Bureau has received requests for $1.4 billion in capital spending from the state agencies. This amount must be trimmed by a half billion dollars to keep the budget within the $925 million cap.

For this analysis, we have assumed that the cap will not be lifted and only 75 percent of the planned projects will start in the 1990-1992 window. This cap will not be lifted until the state improves its fiscal situation and bond rating. If the cap were not in place and planned state capital expenditures in 1991 and 1992 were increased to $1.4 billion, the level requested by state agencies for fiscal year 1991, then even assuming that only 75 percent of planned projects are commenced as scheduled, annual new construction jobs would increase from some 4,300 jobs to over 6,525. Thus, a direct consequence of the state's failure to address the fiscal crisis and improve its bond rating is the loss of some 4,450 worker years in construction jobs in 1991 and 1992.

V. "Rebuilding Boston": The Capital Plan

Boston's five-year (1990-1994), $1011 million capital plan, "Rebuilding Boston," calls for $392 million of public infrastructure investment through 1992. The construction of a new Boston City Hospital patient care facility is the largest single project in the capital plan, with a total cost of $153 million, and construction, already started, will be well underway in 1991 and 1992. With the development of a new Boston City Hospital, the plan assures that the medical needs of the indigent will receive the same quality of care as those of more affluent Bostonians.

There is a large agenda, also, for the repair and reconstruction of the City's streets and bridges. The city is committed to restoring dozens of educational facilities, and has allocated large sums to rehabilitate parks and green spaces. The

fire department has replaced most of its equipment, making it the premier fire department in urban America.

The proposed decision to locate a new $41 million police headquarters near the proposed Ruggles Center project in Roxbury would stimulate an additional $36 million of private investment at Ruggles Center. The two projects can serve as economic anchors for the Southwest Corridor, an area of Boston that has been bypassed by significant private investment for nearly three decades.

Taken as a whole, Boston's Office of Capital Planning's "Rebuilding Boston" is the most comprehensive program of capital improvements since the mid-1960s. During the 1990-1992 window, the plan will produce nearly $392 million of new capital investment, generating a combined total of over 2,300 worker-years in new construction jobs through 1992.

VI. Medical and Higher Education Institutional Development

The educational, medical, and research institutions of Boston and the metropolitan area have been one key to the prosperity enjoyed in the 1980s and earlier decades. These same institutions are capable of nurturing the technology and workforce that will power the emerging industries of the 1990s. They can also serve to stimulate the economy in 1991-1992, as their sources of capital, although affected by the slowdown affecting other sectors of the regional economy, are not exclusively local lending institutions.

Nationally, the demand for health care services continues to rise due to economic affluence, the demographics of an aging population, and the introduction of dramatic new technologies. National employment in the health services is projected to rise by an average 3.0 percent annually through the year 2000, much faster than the 1.2 percent benchmark for the overall economy. Industries that manufacture medical products are also projected to show exceptional growth, and medical products that embody the most advanced technologies will enjoy the most rapidly expanding markets. The Boston area and the regional economy could benefit greatly from these activities in the 1990s.

Boston's institutions of higher education and medicine will have an active program of facilities construction in 1990-1992, including 391,000 square feet for medical research, and requiring an average of over 1000 construction workers per year. Total development investment through 1992 is estimated at $520 million.

This analysis assumes that 75 percent of the projects not already under construction but with planned construction starts during the 1990-1992 period will commence construction on schedule during this period. The projects, already underway or scheduled

for 1991 and 1992, embrace virtually every major institution of medicine and higher eduction in Boston.

VII. Selected Private Commercial Development

Private development investment in eight major commercial and research projects, totalling over $1.0 billion in the next thirty months, will produce over 3700 worker-years in new construction jobs through 1992.

As with institutional development, this analysis assumes that 75 percent of the projects not already under construction but with planned construction starts during the 1990-1992 period will commence construction before 1993. In addition to employment benefits, these projects will yield housing linkage payments of $22.3 million, job linkage payments of $4.5 million, and annual property taxes of $20.5 million. The key projects are:

- International Place Phase II, a $225 million project already under construction, will reach peak construction in 1991-92.
- 125 High Street Phase II, a $120 million office project, already underway, will reach peak employment in 1991.
- Ruggles Center Phase I, a $36 million office building, will provide more than 200 construction jobs and will anchor the emerging economy of Roxbury. Construction start is expected in late 1990.
- Olmsted Plaza, a $309 million renovation of the Sears Building in the Fenway, is designed to provide one million square feet of office, research, retail, and hotel space in the Longwood Medical Area.
- One Lincoln Street, Boston's first minority-owned downtown office building, a $300 million addition to the Dewey Square financial services center, will create 1,700 construction jobs. The project will begin construction in the summer of 1991.
- The Prudential Center renovation, a $241 million project, will provide nearly 1,000 construction jobs and is anticipated to begin construction in early 1991.
- The Charlestown Navy Yard Parcel 7 project, a $90 million portion of the proposed $190 million Phase I addition to the existing 600,000 square foot biomedical research center, will provide 800 construction jobs. Construction is expected to begin in Spring 1991.

- The Boston Marine Industrial Park, including Boston Thermal, a $100 million cogeneration facility, Harbor Gateway, a $50 million industrial facility, and the Marine Industrial Park Garage, a $13 million structure, all scheduled for commencement in the next thirty months.

The commencement of other private development projects city-wide in the next thirty months could add to the positive economic effects of the private projects pipeline.

These investments represent further diversification of Boston's economy, in their locations, uses, and development teams. Moreover, while total private investment is below the banner years of 1985-1988, when private investment led the construction and development economy, private development in Boston still represents the fifth largest volume of private construction activity underway in the nation's top fifty cities. Only New York, Los Angeles, Chicago, and Washington, D.C. will experience more new private investment in the next 36 months.

Conclusion

If experience teaches at all, it tells us that economic development is not inevitable. This is particularly true in New England where foresightedness, not an abundance of natural resources, has traditionally been the key to the region's economic successes. Achieving progress and prosperity in this area involves uncertainty and risk, and relies increasingly on cooperation between public and private sectors.

After record expansion during the 1980s, the Boston, Bay State, and New England economies cooled off. Hardest hit by the downturn were those in construction, followed by those in real estate and financial services. The expected recovery, forecast for 1991, has been threatened by a prolonged fiscal crisis in state government and the worst credit crunch in more than twenty years.

To turn around the severe unemployment in the construction trades and to regain the thousands of jobs lost in 1989 and 1990, we propose that public and private leadership focus their efforts in support of a counter-cyclical $5.3 billion key projects pipeline, to realize substantial employment, tax revenue, and fiscal effects at a time when they are most needed and to build a foundation for future economic expansion.

A comprehensive strategy is necessary because (1) the economic crisis in the construction industry and related fields is the worst the state has faced in two decades, (2) the heralded megaprojects have been delayed and will generate only 15 percent of their total expenditure levels before 1993, and (3) a new economic prime mover, of a similar magnitude to the job-generating high-tech and service

expansion of the 1980s, has yet to emerge. The $5.3 billion key projects pipeline, with its related economic impacts, is a necessary first step to promoting economic recovery.

With the counter-cyclical impact of public and private investment, a resurgence of development construction and jobs, and the resolution of the state fiscal crisis, other near-term problems can be accommodated. Altogether, the domino effect of adverse short-term factors dampening the city and the state economy in 1989 and 1990 can be reversed, if the key projects pipeline strategy is implemented.

Beyond 1992, we must sound a note of caution. The economic conditions we are facing, and the interim strategy for recovery, arise in a context of uncertainty about the Bay State and regional economies. The boom years and prosperity of the 1980s took attention away from troublesome trends in the regional economy. With the decline in the financial services economy, and the slowdown in the construction industry, the weakness of the Bay State's manufacturing base confronts us. Traditionally, manufacturing has been a powerful economic force in the Bay State and New England. Yet, manufacturing jobs have declined since 1984, high-tech jobs since 1985, and defense contracts peaked in 1986, with a temporary resurgence in 1989. The need for new industries poised to expand, as high-tech services and construction expanded in the 1980s, represents a serious structural question for the regional economy. It is too soon to tell whether biomedical research, health industries, and related manufacturing represent the constellation of economic activities that lead growth in the 1990s. A broader spectrum of growth enterprises may be required.

To achieve the full potential of these industries and to nurture other enterprises that will arise, will require a more serious effort to develop the region's human capital, through education, along with the public infrastructure and private plants and facilities. It will also require greater innovation in local and state economic strategies, to guarantee that environmental quality is not sacrificed to achieve economic progress.

An assessment of the longer-term prospects for the regional economy and proposed new economic development strategies will be the subject of our next memorandum. This series of three reports should be discussed with community and business leaders to gain the benefit of their wisdom and insight. Together, we will fashion an economic plan for Boston and the region.

Scenario One:
Summary for Key Projects Pipeline, 1990-1992

Capital Investment, Construction Employment, Payroll & State Income Taxes
In Millions of Dollars

			Calendar Period			
	1990 2nd Half	1991 First Half	1991 2nd Half	1992 First Half	1992 2nd Half	***Totals***
Assumed Commencement As Scheduled						
Mega-Projects						
Capital Expenditures	$191	$254	$332	$442	$468	*$1,687.9*
Construction Employment	519	819	1,268	1,793	1,992	*6,390*
Construction Payroll	$18.7	$29.6	$45.7	$64.7	$71.9	*$230.6*
Mass. Income Taxes	$1.0	$1.6	$2.4	$3.4	$3.8	*$12.1*
City of Boston Capital Plan						
Capital Expenditures	$74.5	$74.5	$92.7	$92.7	$58.3	*$392.6*
Construction Employment	449	449	559	559	351	*2,366*
Construction Payroll	$16.2	$16.2	$20.2	$20.2	$12.7	*$85.4*
Mass. Income Taxes	$0.9	$0.9	$1.1	$1.1	$0.7	*$4.5*
Assumed Scheduled Start of 75% of Projects*						
Massachusetts Public Agencies						
Capital Expenditures	$346.9	$346.9	$346.9	$346.9	$346.9	*$1,734.4*
Construction Employment	2,163	2,163	2,163	2,163	2,163	*10,813*
Construction Payroll	$78.0	$78.0	$78.0	$78.0	$78.0	*$390.2*
Mass. Income Taxes	$4.1	$4.1	$4.1	$4.1	$4.1	*$20.5*
Institutional Projects						
Capital Expenditures	$49.7	$80.7	$133.6	$132.3	$123.3	*$519.5*
Construction Employment	267	394	670	651	595	*2,578*
Construction Payroll	$9.6	$14.2	$24.2	$23.5	$21.5	*$93.0*
Mass. Income Taxes	$0.5	$0.7	$1.3	$1.2	$1.1	*$4.9*
Private Commercial Projects						
Capital Expenditures	$158.3	$158.3	$277.3	$245.0	$169.3	*$1,008.1*
Construction Employment	622	622	963	932	644	*3,783*
Construction Payroll	$22.5	$22.5	$34.8	$33.6	$23.2	*$136.5*
Mass. Income Taxes	$1.2	$1.2	$1.8	$1.8	$1.2	*$7.2*
Totals						
Capital Expenditures	*$820.6*	*$914.2*	*$1,182.9*	*$1,259.1*	*$1,165.6*	***$5,342.4***
Construction Employment	*4,019*	*4,447*	*5,622*	*6,097*	*5,745*	***25,930***
Construction Payroll	*$145.1*	*$160.5*	*$202.9*	*$220.0*	*$207.3*	***$935.8***
Mass. Income Taxes	*$7.6*	*$8.4*	*$10.7*	*$11.6*	*$10.9*	***$49.1***

Note: Construction Employment is measured in terms of "job years": the equivalent of one full-time job of one year's duration. For example, the 25,930 construction employment total represents an average of 10,372 jobs throughout the 2 1/2 year period.

* Assumes scheduled commencement of only 75 percent of projects not currently under construction.

Scenario Two:
Summary for Key Projects Pipeline, 1990-1992
Assuming Scheduled Commencement of 75 Percent of Projects Not Currently Under Construction

Capital Investment, Direct Employment, Payroll & State Income Taxes
In Millions of Dollars

			Calendar Period			
	1990 2nd Half	1991 First Half	1991 2nd Half	1992 First Half	1992 2nd Half	***Totals***
Mega-Projects						
Capital Expenditures	$143.5	$190.5	$249.3	$331.6	$350.9	*$1,265.9*
Construction Employment	389	614	951	1,344	1,494	*4,793*
Construction Payroll	$14.0	$22.2	$34.3	$48.5	$53.9	*$173.0*
Mass. Income Taxes	$0.7	$1.2	$1.8	$2.5	$2.8	*$9.1*
City of Boston Capital Plan						
Capital Expenditures	$55.8	$55.8	$69.5	$69.5	$43.7	*$294.4*
Construction Employment	336	336	419	419	263	*1,774*
Construction Payroll	$12.1	$12.1	$15.1	$15.1	$9.5	*$64.0*
Mass. Income Taxes	$0.6	$0.6	$0.8	$0.8	$0.5	*$3.4*
Massachusetts Public Agencies						
Capital Expenditures	$346.9	$346.9	$346.9	$346.9	$346.9	*$1,734.4*
Construction Employment	2,163	2,163	2,163	2,163	2,163	*10,813*
Construction Payroll	$78.0	$78.0	$78.0	$78.0	$78.0	*$390.2*
Mass. Income Taxes	$4.1	$4.1	$4.1	$4.1	$4.1	*$20.5*
Institutional Projects						
Capital Expenditures	$49.7	$80.7	$133.6	$132.3	$123.3	*$519.5*
Construction Employment	267	394	670	651	595	*2,578*
Construction Payroll	$9.6	$14.2	$24.2	$23.5	$21.5	*$93.0*
Mass. Income Taxes	$0.5	$0.7	$1.3	$1.2	$1.1	*$4.9*
Private Commercial Projects						
Capital Expenditures	$158.3	$158.3	$277.3	$245.0	$169.3	*$1,008.1*
Construction Employment	622	622	963	932	644	*3,783*
Construction Payroll	$22.5	$22.5	$34.8	$33.6	$23.2	*$136.5*
Mass. Income Taxes	$1.2	$1.2	$1.8	$1.8	$1.2	*$7.2*
Totals						
Capital Expenditures	*$754.1*	*$832.1*	*$1,076.6*	*$1,125.4*	*$1,034.1*	**$4,822.3**
Construction Employment	*3,778*	*4,130*	*5,165*	*5,509*	*5,159*	**23,741**
Construction Payroll	*$136.3*	*$149.0*	*$186.4*	*$198.8*	*$186.2*	**$856.8**
Mass. Income Taxes	*$7.2*	*$7.8*	*$9.8*	*$10.4*	*$9.8*	**$45.0**

Note: Construction Employment is measured in terms of "job years": the equivalent of one full-time job of one year's duration. For example, the 23,741 construction employment total represents an average of 9,496 jobs over the 2 1/2 year period.

Scenario Three:
Summary for Key Projects Pipeline, 1990-1992
Assuming Scheduled Commencement of All Projects
Capital Investment, Direct Employment, Payroll & State Income Taxes
In Millions of Dollars

			Calendar Period			
	1990 2nd Half	1991 First Half	1991 2nd Half	1992 First Half	1992 2nd Half	***Totals***
Mega-Projects						
Capital Expenditures	$191	$254	$332	$442	$468	*$1,687.9*
Construction Employment	519	819	1,268	1,793	1,992	*6,390*
Construction Payroll	$18.7	$29.6	$45.7	$64.7	$71.9	*$230.6*
Mass. Income Taxes	$1.0	$1.6	$2.4	$3.4	$3.8	*$12.1*
City of Boston Capital Plan						
Capital Expenditures	$74.5	$74.5	$92.7	$92.7	$58.3	*$392.6*
Construction Employment	449	449	559	559	351	*2,366*
Construction Payroll	$16.2	$16.2	$20.2	$20.2	$12.7	*$85.4*
Mass. Income Taxes	$0.9	$0.9	$1.1	$1.1	$0.7	*$4.5*
Massachusetts Public Agencies						
Capital Expenditures	$462.5	$462.5	$462.5	$462.5	$462.5	*$2,312.5*
Construction Employment	2,883	2,883	2,883	2,883	2,883	*14,417*
Construction Payroll	$104.1	$104.1	$104.1	$104.1	$104.1	*$520.3*
Mass. Income Taxes	$5.5	$5.5	$5.5	$5.5	$5.5	*$27.3*
Institutional Projects						
Capital Expenditures	$66.2	$107.5	$178.1	$176.4	$164.4	*$692.7*
Construction Employment	356	526	893	868	794	*3,437*
Construction Payroll	$12.9	$19.0	$32.2	$31.3	$28.7	*$124.0*
Mass. Income Taxes	$0.7	$1.0	$1.7	$1.6	$1.5	*$6.5*
Private Commercial Projects						
Capital Expenditures	$188.0	$188.0	$346.7	$303.7	$225.7	*$1,252.1*
Construction Employment	742	742	1,197	1,155	858	*4,694*
Construction Payroll	$26.8	$26.8	$43.2	$41.7	$31.0	*$169.4*
Mass. Income Taxes	$1.4	$1.4	$2.3	$2.2	$1.6	*$8.9*
Totals						
Capital Expenditures	*$982.5*	*$1,086.5*	*$1,412.5*	*$1,477.5*	*$1,378.7*	***$6,337.7***
Construction Employment	*4,949*	*5,419*	*6,800*	*7,258*	*6,879*	***31,304***
Construction Payroll	*$178.6*	*$195.6*	*$245.4*	*$261.9*	*$248.2*	***$1,129.8***
Mass. Income Taxes	*$9.4*	*$10.3*	*$12.9*	*$13.8*	*$13.0*	***$59.3***

Note: Construction Employment is measured in terms of "job years": the equivalent of one full-time job of one year's duration. For example, the 31,304 construction employment total represents an average of 12,521 jobs over the 2 1/2 year period.

Mega-Projects Capital Investment and Construction Employment: Official Schedules

Project

Construction Costs in millions of current dollars.
Employment in full-time equivalent jobs.

Harbor Clean-Up (1)	FY88	FY89	FY90	FY91	FY92	FY93	FY94	FY95	FY96	FY97	FY98	FY99	Total
Capital Expenditures	$120.2	$135.1	$175.4	$361.7	$518.6	$570.0	$580.5	$497.5	NA	NA	NA	NA	$6,200
Construction Employment	120	160	244	938	1,835	2,234	1,026	860	680	860	930	616	10,503

Central Artery/Third Harbor Tunnel (2)	1990	1991	1992	1993	1994	1995	1996	1997	1998	Total
Capital Expenditures (3)	$20.9	$146.3	$365.8	$815.2	$940.6	$752.5	$606.2	$439.0	$313.5	$4,400
Construction Employment	100	700	1,750	3,900	4,500	3,600	2,900	2,100	1,500	21,050

Sources: (1) MWRA: Annual Report 1989 & 5-Year Progress Report, Dec. 1989.

(2) Bechtel/Parsons Brinckerhoff, management consultants to the Central Artery Project.

(3) Yearly figures are estimated based on employment.

Prepared By: BRA, PDR, MRJ & JEA, 5.14.90. MEGAJOB2.WK1 (GAMEPLAN)

Capital Investment, Employment, Payroll & Income Taxes
For Artery/Tunnel and Harbor Clean-up Mega-Projects by Half-Year 1990-1992

	Calendar Period					
	1990 2nd Half	1991 1st Half	1991 2nd Half	1992 1st Half	1992 2nd Half	*Total*
Capital Expenditures	$191	$254	$332	$442	$468	*$1,688*
Construction Employment	519	819	1,268	1,793	1,992	*6,390*
Construction Payroll	$18.7	$29.6	$45.7	$64.7	$71.9	*$230.6*
Mass. Income Taxes	$1.0	$1.6	$2.4	$3.4	$3.8	*$12.1*

Sources: MWRA Annual Report 1989 & 5-Year Progress Report, Dec. 1989, Bechtel/Parsons Brinckerhoff, management consultants to the Central Artery Project.

Massachusetts Public Agencies' Estimates of Capital Spending FY 1990

Massachusetts Budget Agencies (FY90 Budget Capped at $925 M)	Estimated Construction Budget (B=Billions M=Millions) Total Cost	Hard Costs (A)	Estimated Construction Employment (B)	Annual Payroll ($ Millions)	Massachusetts Income Tax ($ Millions)
Div. of Capital Planning & Oper.	$282 M	$253.8 M	1,758	$63.5	$3.3
Exec. Off. of Environ. Affairs	$252 M	$226.8 M	1,571	$56.7	$3.0
Exec. Off. of Comm. & Dev. (C)	$176 M	$158.4 M	1,624	$58.6	$3.1
Exec. Off. of Trans. & Const.	$160 M	$144.0 M	998	$36.0	$1.9
Other	$55 M	$49.5 M	343	$12.4	$0.6
Total Budget FY1990 (With Cap at $925 Million)	$925 M	$832.5 M	5,767	$208.1	$10.9
Total Budget Requests FY1991 (Without Cap at $925 Million)	1.4 B	$1.26 B	8,728	$315.0	$16.5

Notes: (A) Hard costs assumed at 90 percent of total cost.

(B) Construction employment calculated by taking 25 percent of hard construction cost and dividing by average annual construction wage of $36,090 in 1990.

(C) EOCD employment is for housing construction, which is 37 percent of hard construction cost.

Sources: Executive Office of Administration and Finance; EOCD New Construction Department

Prepared by: BRA, PDR, JEA & MRJ, 5.14.90, MPA2.WK1 (GAMEPLAN).

City of Boston Capital Fund Projected Expenditures

1989 5-Year Capital Plan and Estimates for FY91 & FY92

City of Boston	Construction Budget ($ Millions) Total Cost	Hard Cost	Estimated Construction Employment	Payroll ($ Millions)	Massachusetts Income Tax ($ Millions)
FY 1990 5-Year Capital Plan	$1,010.6	$859.0	5,950	$214.8	$11.3
Major Projects					
Schools	$164.8	$140.1	970	$35.0	$1.8
Health & Hospitals	$201.0	$170.9	1,183	$42.7	$2.2
Public Works	$276.3	$234.9	1,627	$58.7	$3.1
Other Facilities	$368.0	$312.8	2,167	$78.2	$4.1
Capital Spending FY91	$148.9	$129.5	897	$32.4	$1.7
Capital Spending FY92	$185.4	$161.3	1,117	$40.3	$2.1
Capital Spending FY93	$116.5	$101.4	702	$25.4	$1.3
Capital Spending By Half-Years					
1990 Second Half	$74.5	$64.8	449	$16.2	$0.9
1991 First Half	$74.5	$64.8	449	$16.2	$0.9
1991 Second Half	$92.7	$80.7	559	$20.2	$1.1
1992 First Half	$92.7	$80.7	559	$20.2	$1.1
1992 Second Half	$58.3	$50.7	351	$12.7	$0.7
1990-1992 Total	*$392.6*	*$341.5*	*2,366*	*$85.4*	*$4.5*

Note: Construction employment calculated by taking 25 percent of construction cost and dividing by average annual construction wage of $36,090 in 1990.

Source: "A Five-year Capital Plan Fiscal Years 1990-1994", City of Boston, Mayor's Office of Capital Planning, March 1990.

Prepared by: BRA, PDR, JEA & MRJ, 5.14.90, CAPPLAN.WK1 (GAMEPLAN).

Institutional Projects, Approved and Proposed, with 1990 - 1991 Construction Starts

	INSTITUTION	TOTAL SF	CONSTR'N JOBS	PERMAN'T JOBS	TOTAL DEVELOP COST (MILLIONS)	CONST START	ESTIMATED COMPLETION
APPROVED	Mass. General Inpatient Tower II	286,000	498	564	$101.8	1990-III	1992-IV
	MASCO Mixed Use Development	339,600	137	334	$28.0	1990-III	1992-III
	Boston University Armory - Phase I	550,000	416	110	$85.0	1990-III	1992-III
	Harvard University Morgan Hall	113,000	108	200	$22.0	1990-III	1992-III
	St. Elizabeth's Parking Garage	140,000	24	1	$5.3	1990-III	1993-III
	St. Elizabeth's St. Margaret's Relocation	85,000	152	168	$31.0	1990-III	1993-III
	Harvard Medical School East Quad Research Facility	185,000	322	400	$55.0	1990-II	1992-II
	Harvard Medical School Underground Parking	175,000	49	2	$5.0	1990-II	1992-II
PROPOSED	New England Deaconess Hospital Support Services Facility	46,200	75	210	$5.1	1990-III	1991-III
	Brigham and Women's Clinical Support Facility	202,700	237	534	$48.5	1991-II	1993-II
	Boston College Dormitories	242,000	265	4	$36.0	1991-III	1993-III
	N.E. Deaconess Clinical Facility	253,700	439	500	$124.5	1991-II	1993-III
	Joslin Clinic Research Building	70,000	147	148	$30.0	1991-II	1993-II
	Beth Israel NNICU	6,000	10	12	$2.1	1991-II	1993-II
	Brigham & Women's Tower Lobby	9,200	16	1	$1.4	1991-II	1993-II
	Boston College Thomas More Building Expansion	30,000	39	136	$5.3	1991-III	1993-II
	Northeastern University Parking Garage / Ruggles Street	350,000	72	3	$13.3	1991-III	1994-I
	New England Medical Center Clinical Building (Phase I)	252,000	439	414	$89.7	1991-III	1994-I
	Beth Israel In-Patient Facility	441,870	770	588	$157.3	1991-IV	1994-I
	Harvard School of Public Health Research Expansion	100,000	173	197	$35.6	1991-IV	1993-III
	Boston University School of Management	180,000	132	180	$27.0	1991-IV	1994-II
	TOTAL	**4,057,270**	**4,520**	**4,706**	**$908.9**		

Key Private Commercial Projects
With 1990-1991 Construction Starts

Project	Total Sq Ft (1,000s)	Total Develop't Cost (Millions)	Construction Start Date	Construction Employment	Constr'n Payroll ($ Millions)	Mass. Income Tax ($ Millions)	Boston Property Tax (annually)
125 High St Phase II	448	$120	current	457	$16.5	$0.9	$2,087,904
International Place Phase II	681	$225	current	857	$30.9	$1.6	$3,914,820
Olmsted Plaza I	1,021	$309	summer '90	1,177	$42.5	$2.2	$3,000,000
90 Tremont	220	$70	fall '90	267	$9.6	$0.5	$1,217,944
Ruggles Phase I	150	$36	fall '90	137	$5.0	$0.3	$626,371
Prudential Phases I+II	900	$241	fall '90	918	$33.1	$1.7	$4,193,207
CNY Building Phase I (Parcel 7)	300	$90	fall '91/ winter '92	343	$12.4	$0.6	$1,565,928
One Lincoln	950	$300	summer '91	1,143	$41.3	$2.2	$4,932,960
Marine Industrial Park:							
Harbor Gateway	530	$50	summer '91	175	$6.3	$0.3	NA
Boston Thermal	NA	$100	summer '91	400	$14.4	$0.8	NA
BMIP Garage	NA	$13	summer '90	125	$4.5	$0.2	NA
Totals	*5,200*	*$1,554*		*6,000*	*$216.5*	*$11.4*	*$24,662,004*

Note: Construction Employment is measured in terms of "job years": the equivalent of one full-time job of one year's duration.

Source: Boston Redevelopment Authority, Urban Development & Design Dept.
Project Pipeline, March 1, 1990.

Prepared By: BRA, PDR, MRJ, DAS, & JEA, 5.14.90. KEYPROJ3.WK1 (GAMEPLAN)

Key Private Commercial Projects
With 1990-1991 Construction Starts
Totals by half-year periods, 1990-1992

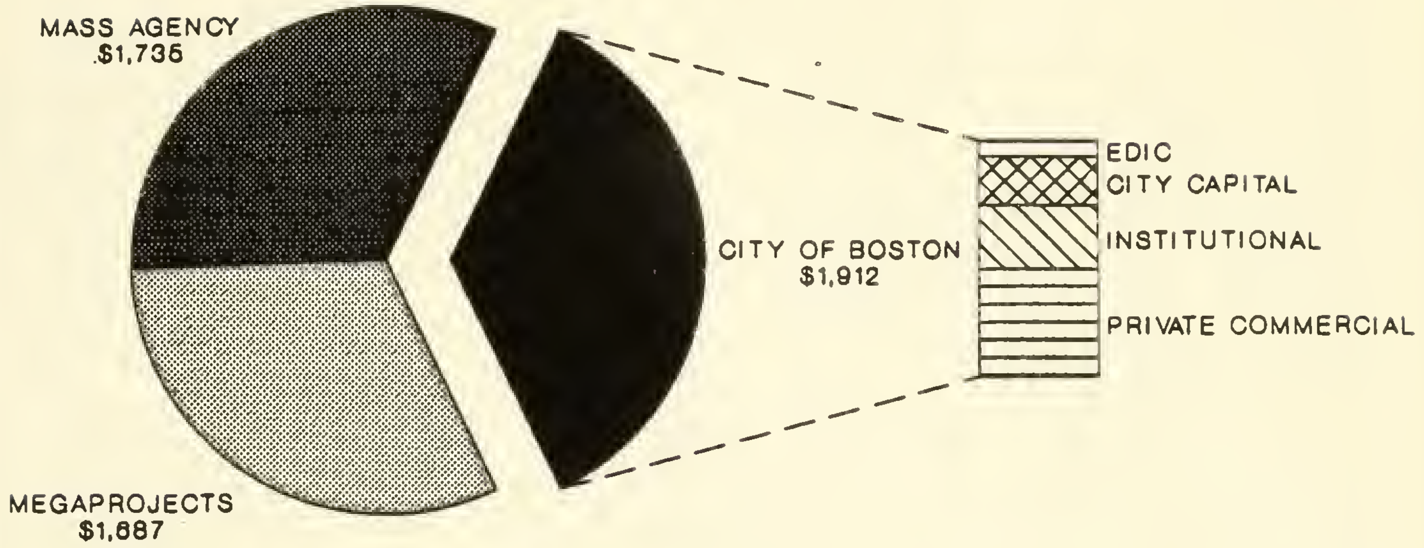
Half Year	Total Development Cost (Millions)	Construction Employment	Construction Payroll ($ Millions)	Massachusetts Income Tax ($ Millions)
1990 Second Half	$188.0	742	$26.8	$1.4
1991 First Half	$188.0	742	$26.8	$1.4
1991 Second Half	$346.7	1,197	$43.2	$2.3
1992 First Half	$303.7	1,155	$41.7	$2.2
1992 Second Half	$225.7	858	$31.0	$1.6
1990-1992 Totals	*$1,252.1*	*4,694*	*$169.4*	*$8.9*

Source: Boston Redevelopment Authority, Urban Development & Design Dept.
Project Pipeline, March 1, 1990.

Prepared By: BRA, PDR; MRJ, DAS, & JEA; 5.14.90. KEYPROJ4.WK1 (GAMEPLAN)

KEY PROJECTS PIPELINE

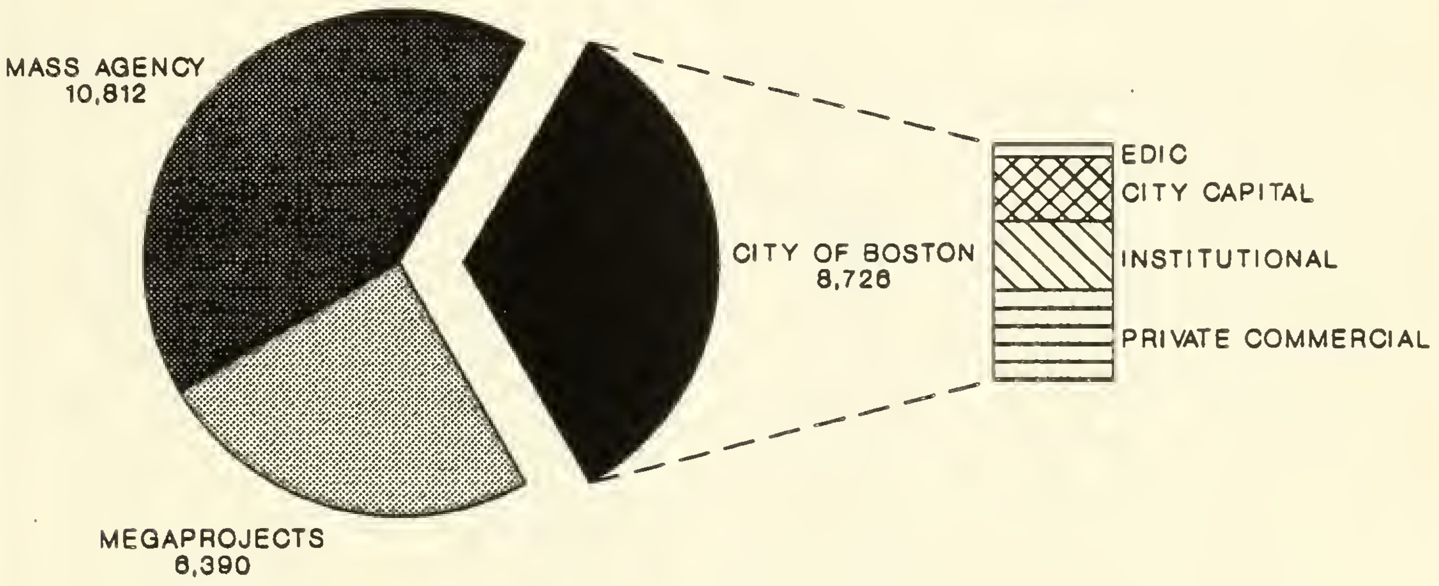
CONSTRUCTION EXPENDITURES: 1990-1992
(IN MILLIONS)



SOURCE: BRA

KEY PROJECTS PIPELINE

CONSTRUCTION EMPLOYMENT:1990-1992
(IN JOB YEARS)



SOURCE: BRA